

PHYSIOLOGY

Blood "Sludge" May Cause Deafness

➤ "SLUDGE" in the blood may be responsible for some cases of deafness, Dr. Edmund Prince Fowler, a New York ear specialist, reports in the *Archives of Otolaryngology* (Oct.), an American Medical Association publication.

The sludge was revealed after examination of the eye's blood vessels, and consisted of clumps of red blood cells. These circulate in the blood during illnesses, after severe injuries, in old age and after emotional upsets.

The sludging was found in various types of sudden and progressive deafness, including Meniere's disease, a condition characterized by head noises and dizziness, and otosclerosis, a degenerative disease of the ear.

When blood cells aggregate in clumps, a shortage of oxygen develops in the area because the blood vessels become clogged and restrict the normal flow of blood. If the oxygen remains cut off too long, damage to the surrounding cells may result, and this may be what happens in ear disorders, Dr. Fowler said.

Emotions and sludging appeared to be related, he added, since most patients with otosclerosis who also showed the sludging had histories of unresolved frustrations and abuses.

During attacks of head noises or dizziness, sludging of the blood regularly occurs. It is also found after the sudden onset of deafness and strongly suggests that sudden deafness is caused by oxygen shortage in the ear's labyrinth due to blocking of the circulation.

Science News Letter, October 12, 1957

GEOPHYSICS

Find Extensive Crack In the Ocean Floor

➤ DISCOVERY of an extensive crack in the floor of the Gulf of Alaska was announced by Rear Adm. H. Arnold Karo, director of the Coast and Geodetic Survey, U. S. Department of Commerce.

Survey ships operating in Alaskan waters during the present season confirmed the existence of this extensive scar in an area particularly significant as potential spawning grounds of devastating seismic sea waves that rush southward over the Pacific with the speed of a jet aircraft.

The information was pieced together by hydrographers at the Survey's Washington office from the data obtained by the survey ships as they criss-crossed the Gulf of Alaska to and from the working grounds in the Bering Sea and Aleutian Islands.

The existence of the scar, or trough as it is referred to in submarine terminology, has been suspected for many years from the scattered depths that have been recorded in the area. The depths were recorded by electronic echo-sounders, which actually draw a profile of the ocean floor.

Until additional data were received from this season's work, the lines had been too

far apart to recognize the separate depressions as part of one continuous trough.

The trough, which is thought to be possibly a fault or weakness in the ocean floor, is located in the Gulf of Alaska and lies parallel to the Aleutian Trench at a distance of 60 miles to the east.

The slightly curving depression is known to be at least 250, and possibly 400, miles long. The bottom of the trough lies 500 to 700 feet below the sea floor which varies in depth between 9,000 and 13,000 feet.

It is estimated to be about two to three miles wide throughout most of its length. There are indications that the trough continues in a southwesterly direction before joining the deeper Aleutian Trench.

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MEDICINE

New Antibiotic Stops Brain-Killing Fungus

➤ A NEW ANTIBIOTIC that can stop a fatal brain-killing fungus disease was reported by public health scientists to the Fifth Annual Antibiotics Symposium meeting in Washington, D. C.

The antibiotic, called amphotericin, is still under investigation and not yet available for general use.

It was used against cryptococcal meningitis, a highly fatal fungus disease that can attack any part of the body although it has a special attraction for the brain and its covering membranes.

The disease is caused by a fungus found in all parts of this country. It gets inside the body, creating abscesses that can resemble either cancer or tuberculosis.

Six victims of the disease were given intravenous injections of amphotericin B and five are still alive after follow-up studies ranging from five to ten months.

In three of them, all the symptoms of the disease have disappeared and they have resumed normal activities.

Another research team headed by Dr. John P. Utz, National Institutes of Health, Bethesda, Md., has used the experimental antibiotic against fungus diseases that have failed to respond to other antibiotics.

Amphotericin is the first antibiotic that has been effective in any way against histoplasmosis, Dr. Utz told SCIENCE SERVICE.

It was also used against coccidioidomycosis, blastomycosis and moniliasis infections. The antibiotic can be given either by mouth or by injection.

The antibiotic is derived from a species of streptomyces fungus that was found along the Orinoco river in Brazil and brought back for investigation.

So far it has proved relatively non-toxic to humans, Dr. Utz said.

Public health scientists reporting on its use against cryptococcal meningitis were Drs. Harry Rubin, Patrick H. Lehan, Martin J. Fitz Patrick, and Michael L. Furcolow, Communicable Disease Center, Kansas City Field Station.

Associated with Dr. Utz in his study were Drs. Donald B. Louria, Ned Feder, Chester W. Emmons and Norman B. McCullough.

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IN SCIENCE

PHYSICS

Confirm Parity Law Not Applicable to Beta Decay

➤ EXPERIMENTS confirming that a basic idea of physics, the law of conservation of parity, does not hold true in the radioactive decay of neutrons have been conducted by University of Chicago and Argonne National Laboratory. (See SNL, Jan. 26, p. 51.)

If parity were conserved, the electrically charged electrons and protons resulting from a neutron's break-up would be emitted equally toward either pole of the axis around which the neutron is turning.

Instead, the recent experiments showed only about 62% as many electrons came off toward one pole as toward the other. The studies, supervised by Prof. Valentine L. Telegdi of the University of Chicago, will be reported in a forthcoming issue of the *Physical Review*, journal of the American Physical Society.

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ENGINEERING

Powerful Test Reactor Open for Inspection

➤ THE ATOMIC Energy Commission has unveiled its engineering test reactor at the National Reactor Testing Station in Idaho Falls, Idaho.

The reactor, known as ETR, provides the highest neutron flux, the number of nuclear fissions occurring per second, of any known reactor. It averages 1.9 million billion neutrons per square centimeter per second.

The \$14,000,000 reactor, described as the "world's most powerful instrument for the development of nuclear power," is considered a "major breakthrough" in the nation's program to advance construction of nuclear power plants for civilian and industrial use, and to convert aircraft and ships to nuclear propulsion.

In addition to a neutron flux twice that of any other reactor in the world, the ETR is the only test reactor with significant experimental space available within its enriched uranium core where scientists and engineers can determine the effects of intense neutron and gamma ray bombardment on materials.

Dr. W. Kenneth Davis, director of AEC's reactor development, has predicted that more than 50 new test reactors such as the ETR will be necessary to support the installation of more than 2,200 nuclear power plants in the U. S. through 1980.

The reactor went "critical," or began its controlled chain reaction on Sept. 19, 1957. It is expected to play a key role as a research tool in the development of economic nuclear power.

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CE FIELDS

BIOLOGY

Chimpanzees Learn to Avoid Lay-Off in Work

➤ A TEMPORARY lay-off, or a short period during which they are not rewarded for the work of pressing a key, is regarded as a punishment by chimpanzees, Dr. C. B. Ferster of the Yerkes Laboratory of Primate Biology, Orange Park, Fla., in *SCIENCE* (Sept. 13).

The animals learn to avoid the lay-off just as they would learn to avoid an electric or other form of punishment.

This is the way Dr. Ferster conducted his experiment:

First the chimpanzees learned to press a telephone key which occasionally produced a reward of food. An overhead light was periodically turned off and at the same time the food magazine was disconnected from the key. The animals soon learned it was no use to press the key when the overhead light was out.

Then a red lamp was installed next to the key. The red light was turned on every 15 minutes for 160 to 180 seconds, depending on the animal's behavior. If the chimp pressed the key during the last 20 seconds of the light, the red light went out and then followed the break in which there was no overhead light and no reward for the work of key pressing. If the animal refrained from touching the key during the last 20 seconds of the red light, there was no break.

In most cases, the chimpanzees pressed the key during the early part of the period during which the red light burned at the same rate that they had learned would produce a food reward. But they stopped working abruptly some time before the final 20 seconds, when touching the key would bring on a break.

For humans, as for chimpanzees, the withholding of expected rewards can serve as a real punishment, Dr. Ferster concludes.

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BIOLOGY

Use Brain Chemical That Reduces Need for Sleep

➤ A BRAIN-STIMULATING chemical, nicknamed DMAE, that can replace hours of sleep as well as help cure mental patients is reported by scientists from Emory University, the University of California and the University of Texas in *Science* (Sept. 27).

DMAE's full name is 2-dimethylaminoethanol and it is believed to be the chemical from which the body makes acetylcholine, an essential substance found in the brain and nervous system.

Without acetylcholine, nerve impulses could not cross over the many nerve gaps that lie between the brain and the rest of the body.

DMAE may occur in natural foods and regulate the body's production of needed acetylcholine, the scientists report.

Small doses of it create a mild and pleasant degree of nerve stimulation that lessens daytime fatigue and allows a person to sleep sounder and for less time at night.

It was also tried in schizophrenic mental patients at higher dosages and caused increased muscular activity as well as making them talk more than usual.

About 50 patients have been on the drug for about a year and have shown no harmful side effects.

In patients other than schizophrenics, DMAE relieves periodic headaches, functional bowel distress and chronic fatigue, the authors reported.

The scientists included Drs. Carl C. Pfeiffer, Elizabeth H. Jenney, William Gallagher, Richard P. Smith and William Bevan, Jr., Emory University, Ga., Drs. Keith F. Killam and Eva King Killam, University of California, Los Angeles, and Dr. William Blackmore, University of Texas, Dallas.

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MEDICINE

"Balloon" X-ray Method Helps Heart Cases

➤ MORE HEART attack victims may be restored to health by a new "balloon" technique demonstrated to scientists at the American Roentgen Ray Society meeting in Washington, D. C.

The X-ray method is used to locate blood clots that are plugging up the coronary arteries. Heart surgeons can thus see exactly where they are and remove them.

Perfectured by Drs. Charles T. Dotter and Louis H. Frische, University of Oregon Medical School, Portland, the method, called occlusion aortography, makes it possible to fill the coronary arteries with a dye that appears white in an X-ray picture.

A small rubber tube with a balloon built into its tip is pushed into the heart through a vein and then sent on up into the aorta, the main artery leaving the heart.

The balloon is quickly inflated, stopping the blood flow in the artery momentarily while the dye is injected downward toward the heart. The dye immediately floods the coronary arteries that begin at the base of the aorta and the X-ray is taken.

Other methods to get dye in the coronary arteries have been tried, but none have been too successful.

If the dye is injected directly into the heart or blood stream, it is diluted too fast and not enough of it reaches the coronary arteries to make them visible.

Another problem with older techniques is that the dye itself is harmful in too great a quantity. Enormous quantities of the dye have to be injected into the heart in order to get enough of it in the coronary arteries for a clear X-ray of them. With the new method, less dye is needed. Also dyes of less strength can be used.

Tests of the balloon technique have begun on humans and so far the results have been highly promising.

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PHYSIOLOGY

Cancer Cell Test May Be Wrong After Childbirth

➤ CELL CHANGES that produce suspicious smears in cervical cancer tests may be quite common after pregnancy.

Doctors should not jump to the immediate conclusion that they signal the start of cancer, three scientists reported to the joint meeting of the American Society of Clinical Pathologists and the College of American Pathologists in New Orleans.

In the majority of cases, these cell changes result from such temporary conditions as infection and injury from the birth process itself. They are not cancer, and the conditions clear up in time.

Breast feeding may also be an important cause of the suspicious smears because it suppresses ovarian hormones, causing the outer layer of the cervix to thin out. This creates an outpouring of large quantities of cervical cells and magnifies what is only a healing process into a suspected case of cancer.

Women showing suspicious smears should be adequately followed, but any surgery should be delayed until the local irritating factors of pregnancy can be removed, the doctors advised.

In a group of 125 new mothers, they found an unusually high number of suspicious smears, 15 cases. Not one case developed into cervical malignancy later on.

The study was done by Drs. Raymond H. Kaufman, Nathan H. Topek and Jack P. Abbott, of Methodist Hospital and Baylor University College of Medicine, Houston, Texas.

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GENERAL SCIENCE

Philippines Aids Science Talent, Understanding

➤ THE DEVELOPMENT of science talent among Filipino youth and the promotion of understanding of science on the part of the public is being organized in Manila by the National Science Board, part of the Office of the President of the Philippines.

Dr. M. V. Arguelles, executive director of the National Science Board, has informed SCIENCE SERVICE that this new program, implemented by a recent law, will draw upon the experience in the United States in organizing science clubs and promoting science consciousness among the public.

A consultant who can advise and inaugurate the science club movement in the Philippines will be invited to come to that country. SCIENCE SERVICE has been asked to recommend candidates from the United States. A young man 30 to 40 years old with scientific and educational experience and interest in the growth of the Philippine people will be preferred.

The Philippines sent two delegates to the National Science Fair at Los Angeles last May to study this method of inspiring and recognizing science ability and interest among youth. (See p. 229.)

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